MERRYMEETING RIVER

2017 SAMPLING HIGHLIGHTS

Water quality data displayed in Tables 1 and 2 were collected at sampling points within the Merrymeeting River watershed. Sampling locations were located at readily accessible locations where state and local roads intersected the main branch of the Merrymeeting River and the Coffin Brook tributary (Figure 6).

Blue = Excellent

Yellow = Fair

Red = Poor

Light Gray = No Data

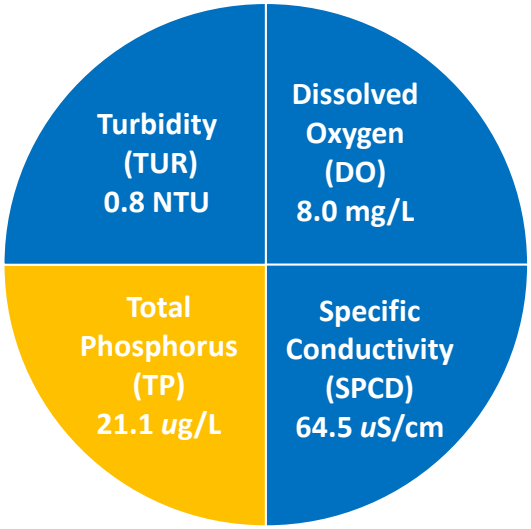


Figure 1. Merrymeeting River Average Water Quality (2017)

Table 1. 2017 Merrymeeting River Watershed Seasonal Average Water Quality Measurements.

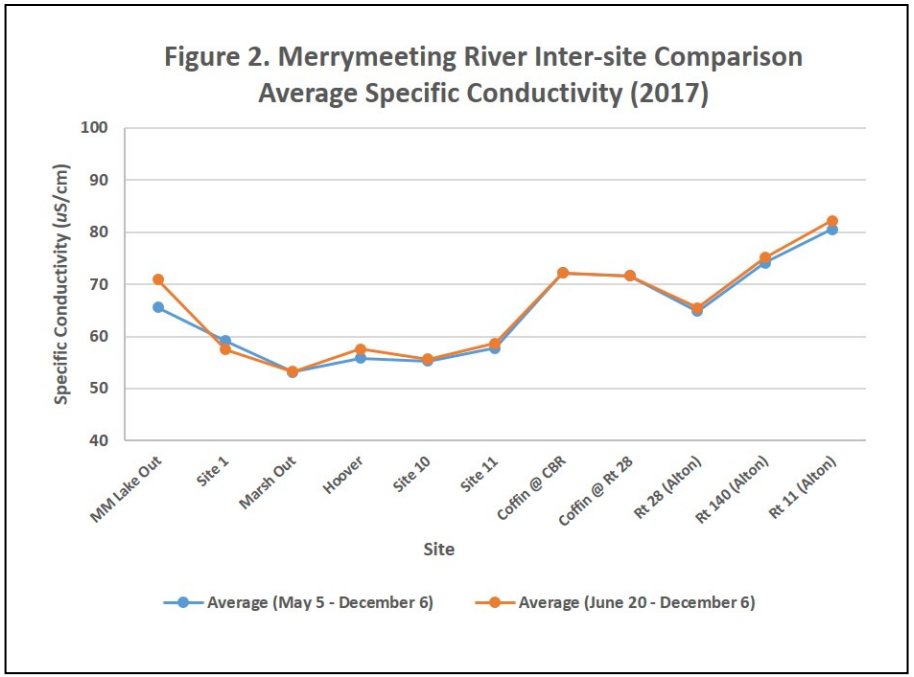
Parameter	Assessment Criteria					Merrymeeting River Subwatershed Average (range)	Merrymeeting River Subwatershed Classification
Turbidity * (NTU)	< 0 - 5.0 Desirable	6 – 10 Low Impact	11 – 50 Moderate impact	51 – 100 Moderate – high impact	> 101 High impact	**0.8** NTU (range: 0.2 – 3.9)	Desirable
pH (standard units)	< 5.5 suboptimal for successful fish growth and reproduction	5.5 – 6.5 sufficient for successful fish growth and reproduction	6.5 – 8.5 optimal range for fish growth and reproduction			6.6 standard units (range: 6.1 – 7.4)	Optimal range for fish growth and reproduction
Dissolved Oxygen (mg/L)	< 5 Suboptimal for successful brook trout growth and survival	> 5 Typically sufficient for successful brook trout growth and survival				8.0 mg/L (range: 1.6 – 14.0)	Typically sufficient for successful brook trout growth and survival
Specific * Conductivity (uS/cm)	0 – 100 Normal	101 – 200 Low Impact	201 – 500 Moderate Impact	> 501 High Impact		64.5 *u*S/cm (range: 46.8 – 109.1)	Normal
Total * Phosphorus (*u*g/L)	< 10 *u*g/L Ideal	11 - 25 Average	26.0 – 50.0 More than desirable	> 51 Excessive		21.1 *u*g/L (range: 3.0 – 62.5)	Average

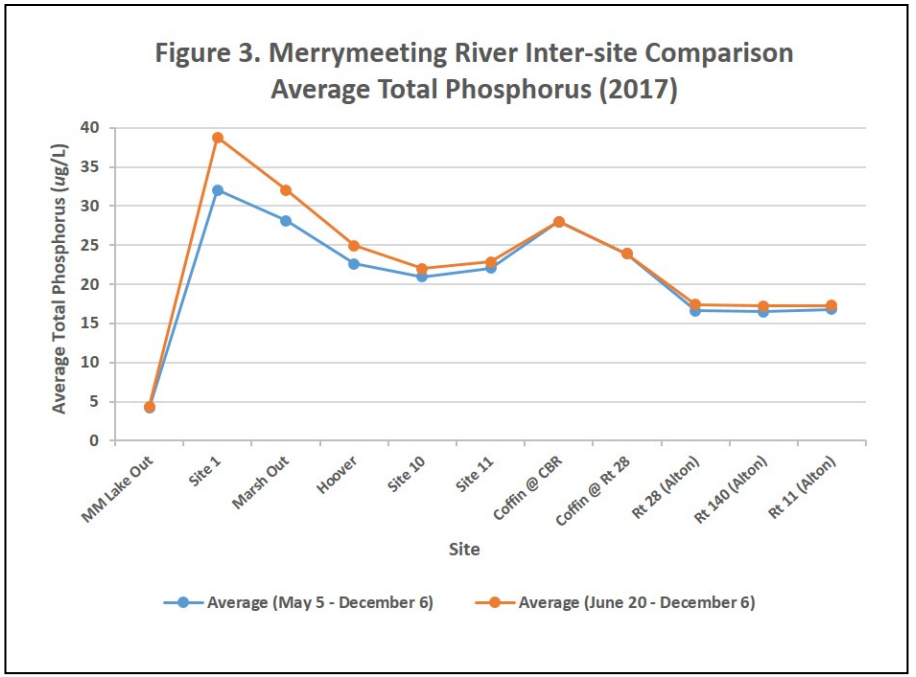
* Water quality assessment criteria are provided by the New Hampshire Department of Environmental Services for general guidance only. Natural variations among rivers and streams will occur and should be considered when interpreting the water quality data.

Table 2. 2017 Merrymeeting River Watershed Seasonal Average Water Quality Inter-site Comparison

Site ID *	Average (range) Turbidity (NTU)	Average (range) Specific Conductivity (*u*S/cm)	Average (range) Total Phosphorus (*u*g/L)	Average (range) Dissolved Oxygen (mg/L)	Average (range) pH (standard units)
MM Lake Outflow	0.4 (0.3 – 0.6)	65.6 (54.5 – 109.1)	4.2 (3.0 – 6.0)	9.4 (7.2 – 11.7)	7.0 (6.7 – 7.4)
1 Boat Launch	1.1 (0.4 – 3.9)	59.1 (53.6 – 68.8)	32.1 (15.8 – 62.5)	9.8 (7.5 – 11.6)	6.8 (6.7 – 7.0)
Marsh Outlet	0.7 (0.5 – 1.3)	53.2 (46.9 – 60.0)	28.1 (16.9 – 49.0)	8.8 (7.1 – 11.9)	6.7 (6.6 – 6.9)
Hoover Bridge	0.6 (0.3 – 1.4)	55.8 (46.8 – 62.9)	22.6 (15.4 – 30.7)	8.6 (5.6 – 12.2)	6.7 (6.5 – 7.0)
10 (Bridge)	0.6 (0.5 – 1.0)	55.2 (49.4 – 59.2)	21.0 (16.9 – 26.4)	9.1 (7.1 – 13.1)	6.9 (6.8 – 7.0)
11 Rt. 11 Ramp	0.6 (0.3 – 0.9)	57.8 (51.3 – 62.9)	22.0 (15.9 – 31.1)	9.1 (6.8 – 13.2)	6.8 (6.7 – 7.0)
Coffin Brk. @ 28	1.2 (0.5 – 1.5)	72.2 (57.6 – 89.6)	28.0 (15.2 – 38.0)	7.0 (4.7 – 12.2)	6.4 (6.1 – 6.6)
Coffin Brk. @ CBR	1.3 (0.6 – 2.7)	71.6 (56.8 – 91.1)	23.9 (12.9 – 34.0)	6.5 (4.0 – 12.2)	6.4 (6.3 – 6.6)
Route 28 (Alton)	0.5 (0.2 – 1.0)	64.8 (58.6 – 69.8)	16.6 (13.1 – 25.1)	5.2 (1.6 – 11.1)	6.3 (6.1 – 6.8)
Route 140 (Alton)	0.5 (0.2 – 0.8)	74.1 (64.9 – 85.5)	16.5 (13.2 – 23.8)	6.3 (3.3 – 11.8)	6.4 (6.2 – 6.7)
Route 11 (Alton)	0.9 (0.4 – 1.5)	80.5 (70.5 – 94.7)	16.8 (11.0 – 23.4)	8.4 (5.8 – 14.0)	6.6 (6.4 – 6.8)

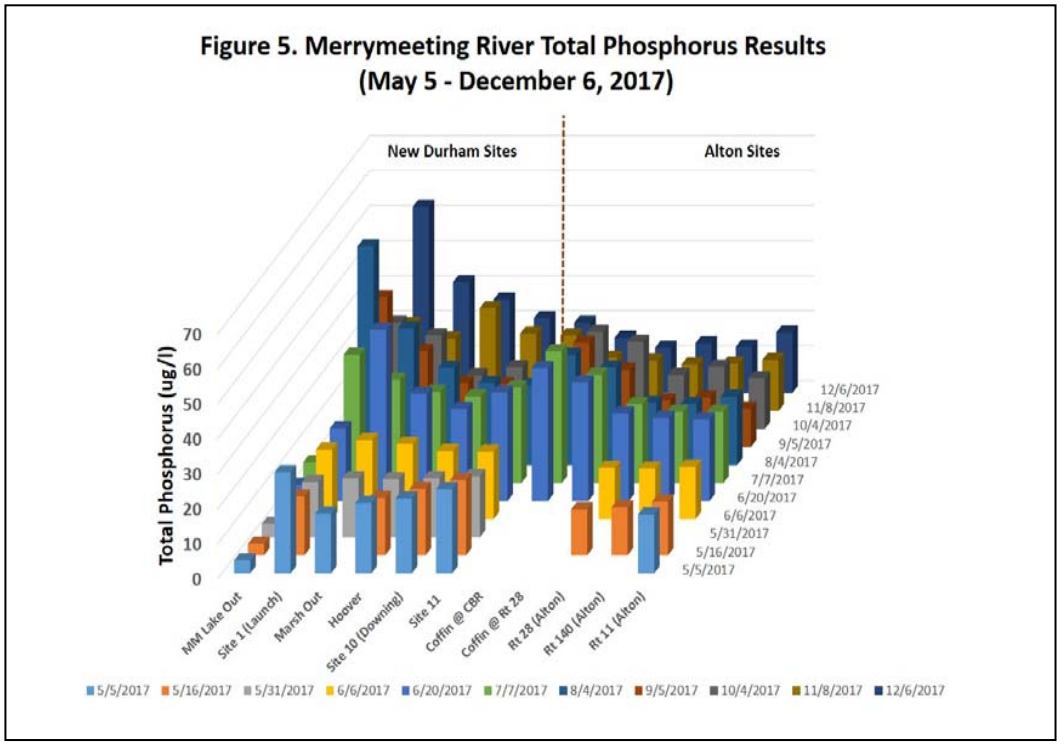
* Refer to Figure 6 for a map of the sampling locations.





Figures 2 and 3. Average Specific Conductivity and Total Phosphorus concentrations measured among the Merrymeeting River sampling locations in 2017. The orange circles/lines illustrate the average values documented between June 20 and December 6 when monthly sampling was conducted at each of the eleven sampling locations. The blue circles/lines illustrate the average values measured between May 5 and December 6 when some sampling sites were not consistently sampled among sampling dates.

Figure 4. Total Phosphorus concentrations reported on each sampling date between May 5 and December 6. The Coffin Brook Sampling Sites (@ Coffin Brook Road and @ Route 28) and Merrymeeting River (@ Rt 28, @ Rt 140 and @ Rt 11 Alton) were not consistently sampled until June 20.



Merrymeeting River Watershed sampling highlights (May 5 – December 5, 2017)

Water quality monitoring was implemented along the Merrymeeting River to screen for problems, provide baseline data that will provide a better understanding of spatial and temporal variability among locations, and to provide site-specific data that will support the development of a watershed management plan. Preliminary Merrymeeting River sampling consisted of seven sampling stations on May 5 that expanded to eleven stations that were monitored on a monthly basis between June 20 and December 5, 2017. Supporting data were also collected in Merrymeeting Lake, Marsh Pond, Jones Pond, and Downing Pond. The lake and pond results are summarized in stand-alone highlight reports generated for each of the four water bodies.

Turbidity: The Turbidity levels were low among sampling locations. These sampling events did not include periods of peak rainfall that would qualify as typical storm event sampling.

pH: The pH varied among sampling dates and sampling locations. The highest pH values among the eleven sampling locations were typically documented at the most upstream sampling location, the Merrymeeting Lake Outflow, while lower pH concentrations were documented as water drained the Merrymeeting Marsh (Rt 28) and the Coffin Brook (@ Coffin Brook Road and @ Rt 28) wetland complexes. Seasonally, the pH was lower among most sampling locations on the July 7 and August 4 sampling dates.

Dissolved Oxygen: Dissolved oxygen concentrations documented among the sampling sites generally remained above the threshold of 5 milligrams per liter. However, there were notable variations among seasons and among sampling sites. Higher dissolved oxygen concentrations were documented both early and late in the season and corresponded to lower water temperatures at those times. Among the sampling locations, some of the lower dissolved oxygen concentrations were documented as water exited the large Coffin Brook (@ Coffin Brook Road and @ Route 28) and the Merrymeeting Marsh (@ Rt 28) wetland complexes.

Specific Conductivity: The specific conductivity leaving Merrymeeting Lake (MM Lake Outlet) was generally higher than the conductivity measured downstream at Site 1, Hoover, Site 10, and Site 11 where the conductivity was typically similar among the four sampling locations. Conductivity was typically elevated in the Coffin Brook subwatershed (@ Coffin Brook Road and @ Rt 28) relative to the aforementioned sampling locations that constitute the Merrymeeting River headwaters located in New Durham. The specific conductivity gradually increase among sampling locations as the water exited the Merrymeeting Marsh wetland complex (Rt 28 Alton) and entered the more developed portion of the watershed (Rt 140 and Rt 11 Alton).

Total Phosphorus: Total phosphorus concentrations were consistently lowest as the water exited Merrymeeting Lake (MM Lake Outflow), were at or near the highest levels at Site 1 (Launch) and oftentimes decreased as the water flowed downstream. Water contributed through the Coffin Brook subwatershed (@ Coffin Brook Road and @ Rt 28) also tended to include some of the higher total phosphorus concentrations. Total phosphorus concentrations were lower as the water exited the Merrymeeting Marsh Wetland Complex (@ Rt 28) flowed into Wentworth Pond (@ Rt 140) and discharged into Lake Winnipesaukee (@ Rt 11 Alton). The water discharging into Lake Winnipesaukee (@ Rt 11) was consistently near or in excess of 12 parts per billion between May 5 and December 5, 2017.

Recommendations for Property Owners:

Implement Best Management Practices within the Merrymeeting River watershed to minimize the adverse impacts of polluted runoff and erosion into the River System and interconnected Lakes and Ponds. Refer to “Landscaping at the Water’s Edge: An Ecological Approach” and “New Hampshire Homeowner’s Guide to Stormwater Management: Do-It-Yourself Stormwater Solutions for Your Home” for more information on how to reduce nutrient loading caused by overland run-off.

- http://extension.unh.edu/resources/files/Resource004159_Rep5940.pdf
- http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-11-11.pdf

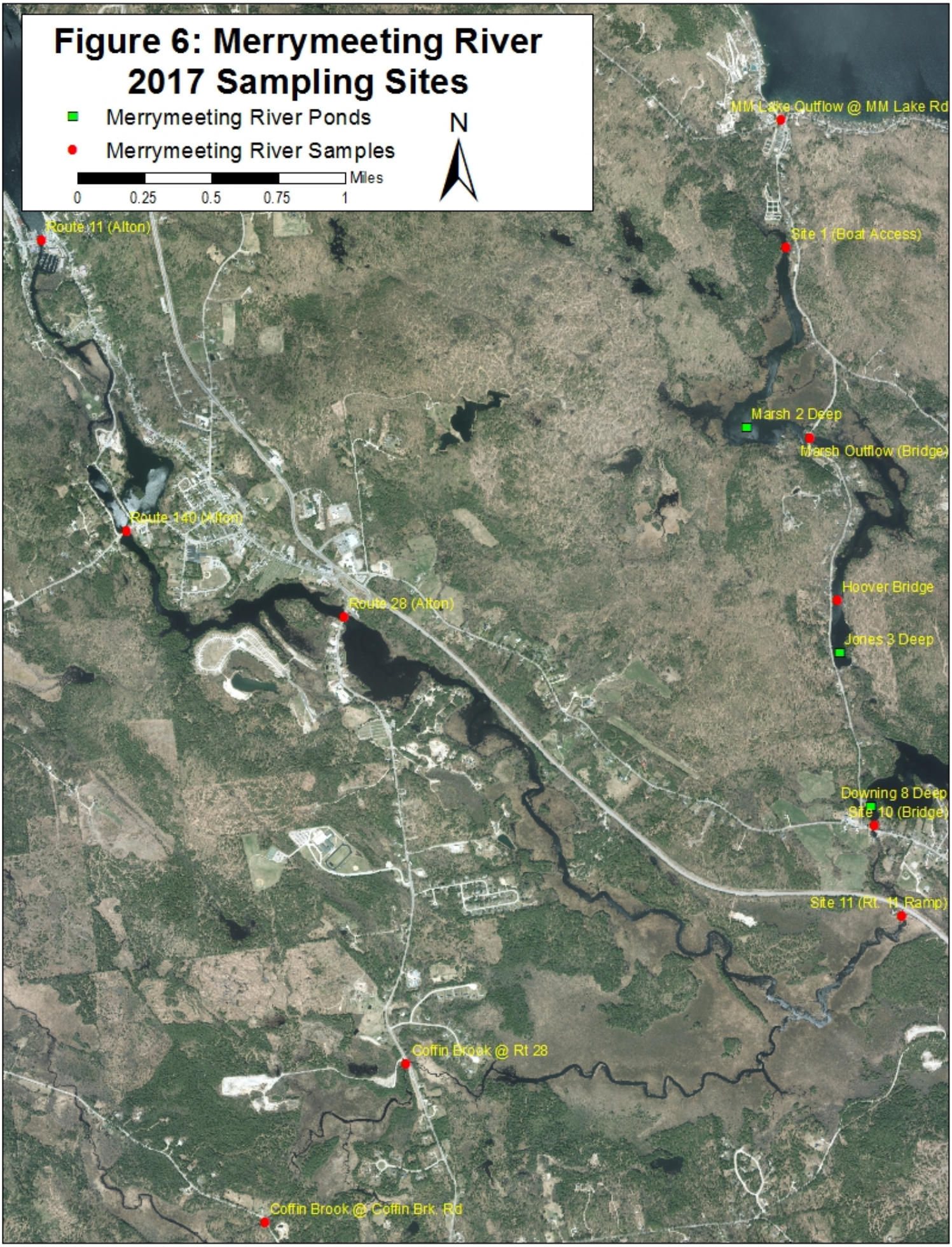


Figure 6: Merrymeeting River 2017 Sampling Sites
Merrymeeting River Ponds
Merrymeeting River Samples
Miles
0
0.25
0.5
0.75
1
N
MM Lake Outflow @ MM Lake Rd
Route 11 (Alton)
Site 1 (Boat Access)
Marsh 2 Deep
Marsh Outflow (Bridge)
Route 140 (Alton)
Hoover Bridge
Route 28 (Alton)
Jones 3 Deep
Downing 8 Deep
Site 10 (Bridge)
Site 11 (Rt. 11 Ramp)
Coffin Brook @ Rt 28
Coffin Brook @ Coffin Brk. Rd